# Yas Common School

# Molecular Biology of the Gene

## Biolab Activity: Candy Central Dogma

## Objective:

To illustrate the central dogma of molecular biology (DNA replication, transcription, and translation) using candies, marshmallows, and sour pink sticks.

### Materials Needed:

1. Candies or gummy bear
2. Marshmallows (N- Bases)
3. Sour pink sticks - to make strands of DNA.
4. A3 paper or large sheets of paper
5. Markers
6. Scissors
7. Tapes, glue
8. Toothpicks.

## Instructions:

1. **Introduction (5 minutes):**

Begin by introducing the concept of the central dogma of molecular biology, which describes the flow of genetic information within a biological system. Explain the three main processes: DNA replication, transcription, and translation.

2. **Preparation (5 minutes):**

Distribute candies, marshmallows, and sour pink sticks to each student or group of students.

**DNA Replication (10 minutes):**

Instruct the students to create a DNA double helix structure using the candies, sour pink sticks and toothpicks. Each gummy bear represents a nucleotide base (adenine, thymine, cytosine, or guanine). They should pair complementary bases (A with T, and C with G) to form the double helix. Students can connect the candies using toothpicks. These will make the rungs of the ladder. And Pink sour sticks represent the ladder of the DNA.

**Transcription (10 minutes):**

Explain the process of transcription, where DNA is used as a template to synthesize RNA. Have the students use the sour pink sticks to transcribe one strand of the DNA double helix they created in the previous step. Each candy nucleotide should be replaced with the corresponding RNA base (adenine with uracil, cytosine with guanine, etc.).

**Translation (15 minutes):**

Have the students arrange their marshmallow sequences to form a chain, representing a protein. They can be creative in using candies or marshmallows to use as amino acids and can join them using small pieces of toothpicks. They can tape or glue the marshmallows onto the A3 paper to create a visual representation of the protein being synthesized.

**Assembling the Central Dogma (10 minutes):**

3. **Discussion (5 minutes):**

Conclude the activity with a discussion about the central dogma and the importance of each step in the flow of genetic information. Encourage students to ask questions and discuss any challenges they encountered during the activity.

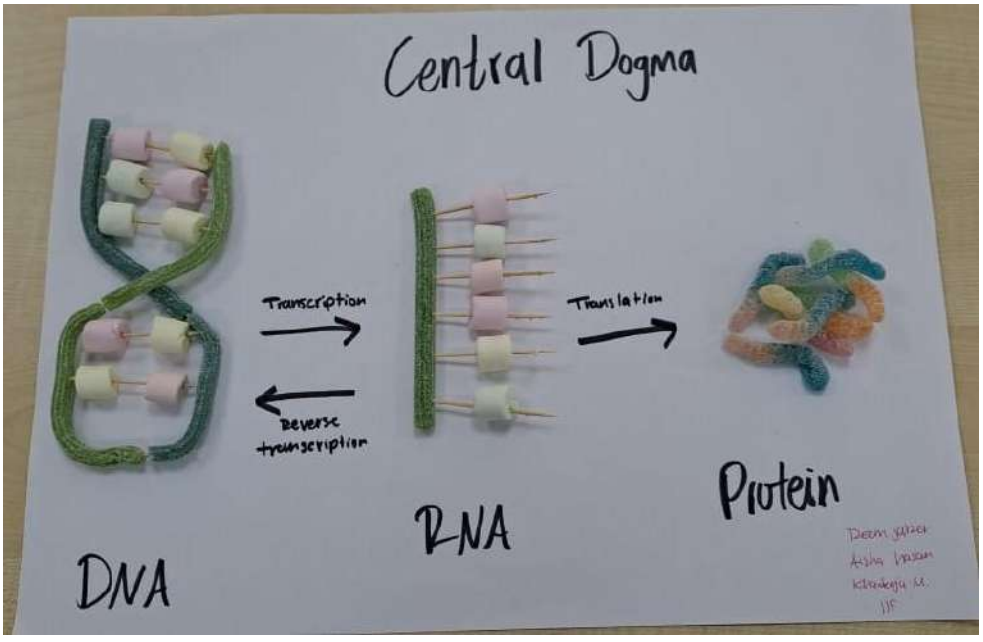
4. **Cleanup (5 minutes):**

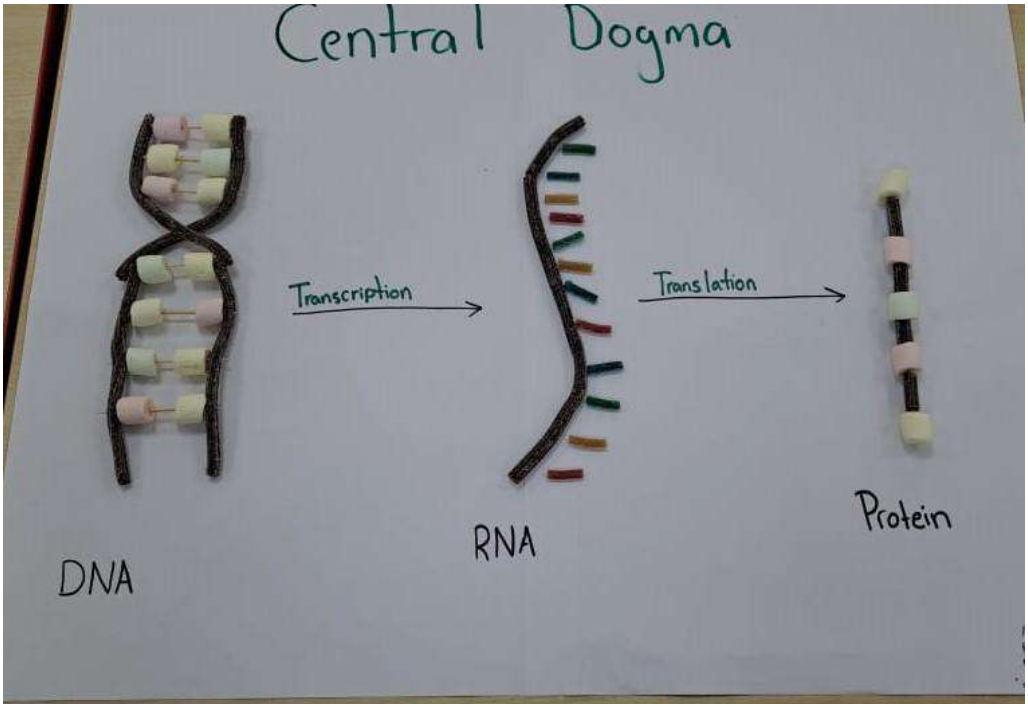
Ensure that all materials are properly cleaned up and disposed of.

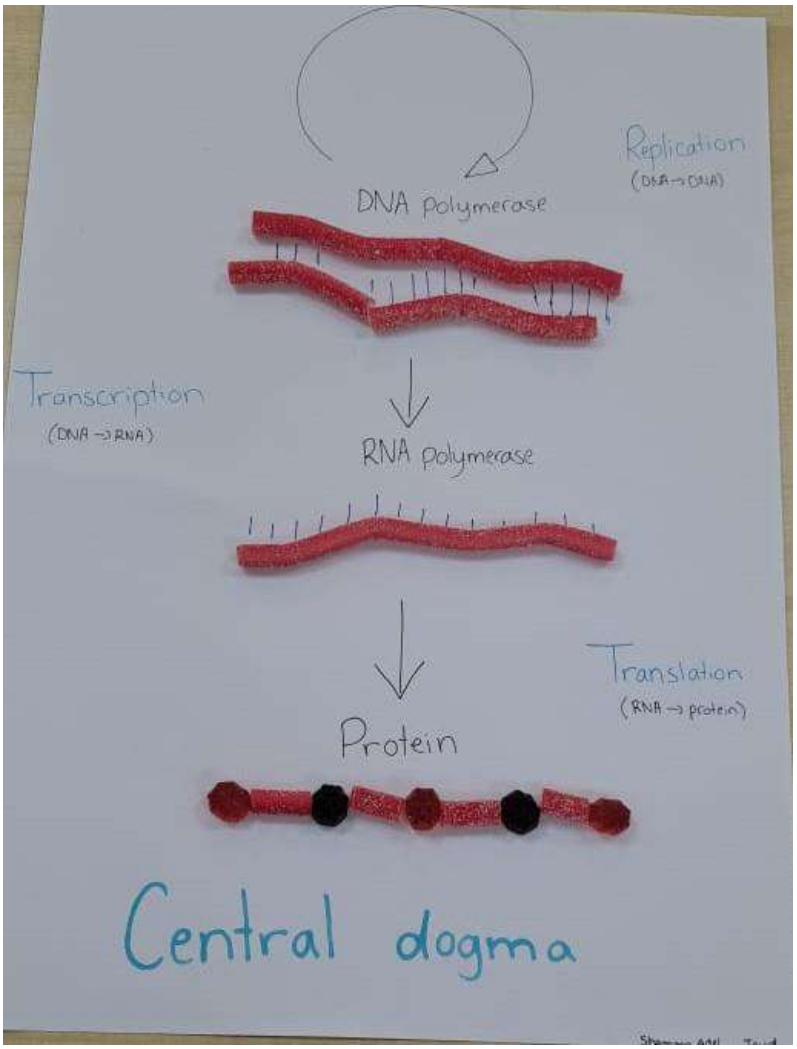
Note: Monitor the students closely during the activity to ensure safety, especially if any students have allergies to the materials used.

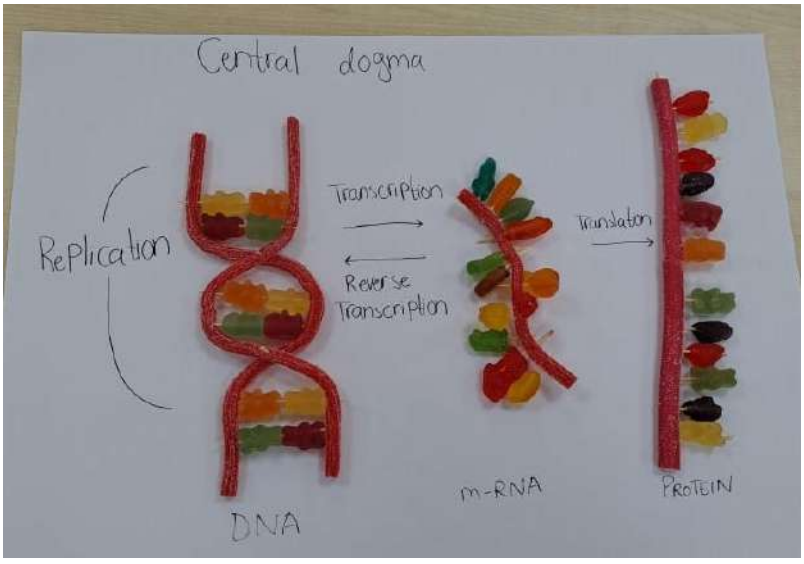
Results

Results -


Central Dogma
Transcription
Reverse transcription
Translation
DNA
RNA
Protein


Central Dogma
Transcription
Translation
DNA
RNA
Protein


Replication
(DNA → DNA)
DNA polymerase
Transcription
(DNA → RNA)
RNA polymerase
Translation
(RNA → protein)
Protein
Central dogma


Central dogma
Replication
Transcription
Reverse Transcription
Translation
DNA
m-RNA
PROTEIN